Researcher: Ceiling Tiles May Cause Majority of SBS

A Cornell University study, led by Alan Hedge, has tentatively concluded that flaking particles from ceiling tiles made of glass wool may be a major contributor to Sick Building Syndrome.

What this means to building operators, Hedge said, is that tiles with fiberglass and other glass wool ingredients should not be bought in the first place. If tile with glass wool ingredients are already installed, proper office cleaning can reduce exposure to the harmful particles.

The study, *Effects of Man-Made Mineral Fibers in Settled-Dust on Sick Building Syndrome in Air-Conditioned Offices*, is the second major research report recently to conclude that thorough office cleaning may mitigate SBS.

Earlier this year, British researchers at the United Kingdom Building Research Establishment, Watford, U.K., published their findings, which concluded that indoor surface pollution, such as dust, fibers and microorganisms deposited in or on surfaces in buildings may cause SBS (see *IPN* Oct. 15, Vol. 6, No. 21, p 165). They, too, recommended thorough office cleaning to mitigate the impact of dust and other particles.

The amount of mineral fibers in settled dust correlates with the number of SBS symptoms reported by workers. In other words, the higher the mineral dust concentration, the greater number of workers' complaints. Dust that causes problems comes from flaking ceiling tiles, which are friable in the grids of false ceilings, Hedge said.

False Ceiling Used as Plenums

The glass wool tiles flake easily because in newer office buildings return air ducts for the heating, ventilating and air-conditioning systems have been eliminated and the plenum, the space between the false ceiling and floor above, serves as a return air corridor. The returning air, as well as noise vibrations, maintenance work, and other disturbances, such as tiles becoming damp, causes flaking and the release of harmful particles, Hedge explained.

The glass wool fibers are an eye and lung irritant and may also serve as a carrier for other pollutants, such as tobacco smoke, volatile organic compounds, formaldehyde, among other things. "Just look at the instructions for mineral fiber ceilings. They say avoid breathing in the material and avoid contact with skin." Ceiling installers display SBS-type symptoms, but when they are away from the job those symptoms generally clear up, Hedge said.

Tobacco Smoke Ruled Out

The study also ruled out a number of culprits, such as tobacco smoke and VOCs, that have been traditionally blamed for SBS. "Although many people assume that Sick Building Syndrome is related to gaseous air pollutants, many studies, including ours, have been unable to find the link."

They found no relationship between the number of workers' complaints and indicators of air quality such as carbon monoxide, formaldehyde, temperature, humidity or the air's staleness. Employees did not report more SBS style symptoms in buildings where their co-workers smoked.

There also may be a psychological factor involved in SBS complaints. People are not biologically equipped to detect air quality, such as relative humidity, carbon monoxide, radon, and many other gases. Office workers make decisions about air quality based on smell, temperature, air movement, and their perception of humidity, and visible dust. These visual triggers coupled with colleagues reports that the building made them sick, and if investigators wearing protective masks are prowling the building's offices, that combination of factors could make other employees feel that the building is making them sick, too.

Range of Susceptibility

There is clearly a range of susceptibility to SBS-stlye illness and "people are not lying, they are reporting what they are feeling, but that doesn't necessarily correlate with what they are exposed to," Hedge said.

However, after an SBS incident, people begin to distrust the building, Hedge said, drawing an analogy of a homeowner who has been burglarized and never again feels fully comfortable in his house.

Besides thorough cleaning, using high filtration vacuum bags, bags that can filter and contain particles as small as one micron, air can be cleaned at each work station with devices that use activated charcoal and HEPA filters.

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